Codian ISDN GW 3200 Series User Guide

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Codian ISDN Gateway 3200 Series User Guide

Welcome to the Codian ISDN gateway user guide. You can access all help topics from this contents page. You can also access context-sensitive help for a particular page when using the ISDN gateway web browser interface, by clicking the icon on that page.

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Logging into the Web Interface

The Codian ISDN gateway web interface is used for administering the ISDN gateway, monitoring active and completed calls' progress, managing dial plans and users, and for obtaining event logging infomation for reference or for troubleshooting complex issues.

When connecting to the Codian ISDN gateway web interface, you must log in so that the ISDN gateway can associate the session with your configured user and a set of access privileges. The ISDN gateway has a set of configured users, and each user has an ID and password that are used for logging in.

1. Using a web browser, enter the host name or IP address of the ISDN gateway.
2. Click on the **Log in** button.
3. Enter your assigned **User Name** and **Password**.

The main menu appears, restricting the available options based on your access privileges. Administrators have full access; guest users can view the progress of active calls.

Related Topics

- Web Interface Tips

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Web Interface Tips

These tips can help you more effectively use the ISDN gateway web interface:

- Displaying Updated Information
- Working with Tables
- Getting Help

Displaying Updated Information

The ISDN gateway web interface primarily displays static information that represents a snapshot of the status when the page was requested or refreshed. However, information on the pages does not automatically update. Instead, you must click the **Refresh** button on your web browser to display that latest information.

For example, if you are viewing the Active calls list, it will not automatically update to show new calls or reflect the changing progress of existing calls.

Working with Tables

Most of the ISDN gateway configuration and status information display in tables, which typically resemble the following:

Delete selected | Add new entry | Page 1 2 3 4 5 6 7

	Name	Address	Status
☐	a sample name	224.2.127.254	Responding normally
☐	building bridges	10.2.1.47	Responding normally
☐	middle entry	224.2.127.254	Responding normally
☐	xylophone	224.2.127.254	Responding normally
☐	zebra	224.2.127.254	Responding normally

Delete selected | Add new entry | Page 1 2 3 4 5 6 7

Hyperlinks

In general, when viewing items in the table, you can click on the "Name" field to display more detailed configuration information about that item. Typically, you can also change and save the configuration for that specific item from that window. Items in some tables may alternatively have a "More" link, or similar.

Page Indicators

Page 1 2 3 4 5 6 7

If a table contains more entries than can be usefully displayed on a single screen, those entries are split up into multiple pages. The number of the page currently displayed is highlighted. To move to another page, click its associated link. Unused pages (representing unused table capacity) are grayed out.

Buttons

Tables typically have two or more buttons associated with them that allow you to perform tasks to either all items or just selected items in the table. Refer to the context-sensitive Help topics for the specific tables for detailed assistance.

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Checkboxes

- ☐ item 1
- ☐ item 2
- ☐ item 3

Clicking in the checkboxes next to items indicates that you want to apply an operation to those items. You can select each item individually, but sometimes you might want to apply the same operation to many items simultaneously. For example, you might do this to disconnect several calls at once rather than having to disconnect them all separately.

You can also delete all selected items by clicking on the items you want to remove, and pressing the **Delete selected** button.

Getting Help

If you need assistance while working with the ISDN gateway web interface, click the Help icon on that page to display context-sensitive help content. This content explains fields and offers tips about how to use that specific web page.

Related Topics

- Logging into the Web Interface

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Getting Started with the ISDN gateway

Ensure you have correctly completed the physical setup of the ISDN gateway following the instructions contained in the installation guide that accompanied the unit. You must also ensure that your endpoints and MCU are correctly configured to operate with the ISDN gateway, for more information, refer to the Quick Start guide on the CD.

Before you can make calls using the ISDN gateway, you need to complete the setup of the unit using the web interface as follows:

1. **Log into the ISDN gateway**: Use your browser to navigate to the IP address of the ISDN gateway. Click **Change log in** and enter the user name 'admin' with no password. Note that Codian recommends that you change the admin user account to use a password as soon as possible.
2. **Set up the ISDN interfaces**: Go to **Home > Settings > ISDN:**
    a. Select the **ISDN interface type** to match that of your installation; E1 is typically used in the UK and mainline Europe, T1 in North America, and J1 in Japan.
    b. Select the **E1 CRC-4** option as required by your network. Typically, if you have an E1 ISDN network, enable this option.
    c. Click **Apply changes**. If you made any changes on this page, you must restart the ISDN gateway. (Go to **Home > Settings > Shutdown** and click **Shut down ISDN GW**.)
3. **Configure ISDN ports**: Go to **Home > Settings > ISDN ports**:
    a. Set low and high channels:
        - If you have a fully-populated PRI (this is the normal case) set **Low channel** to '1' for all network types and **High channel** to '31' for E1 networks, and to '23' for T1 or J1.
        - If you have a fractional PRI, where your provider offers a reduced number of B-channels, enter alternative values as appropriate.
    b. Set the channel search order: When making calls, the ISDN gateway examines which B-channels are free before placing a call. This search can be performed starting with the high channel and working down, or starting with the low channel and working up. Your ISDN provider will be able to advise which scheme to use, but the choice is not critical.
    c. Click **Apply changes** and then, if required, repeat the above steps to configure further ISDN ports. Select which port you wish to configure using the numbered links at the top right of the page.
4. **Configure the dial plan**: The default behavior of the unit is to reject all calls. You must configure a dial plan to allow permitted calls to be placed. The simplest configuration is to create a dial plan that will connect any 'IP to ISDN' call that has been routed to the ISDN gateway to the number that the caller has dialed (using any free enabled port) and that will connect any 'ISDN to IP' call to the auto attendant of your MCU:
    a. Go to **Home > Dial plan > IP to ISDN** and click **Add rule**.
    b. For **Condition**, select **Match any called number**.
    c. For **Action**, select **Call with the original called number**.
    d. Leave the other values unchanged. Click **Add rule** to add the rule to the dial plan.
    e. Now go to **Home > Dial plan > ISDN to IP**, and click **Add rule**.
    f. For **Condition**, select **Match any called number**.
    g. For **Action**, select **Call this number** and enter the IP address of your MCU.
    h. Leave the other values unchanged. Click **Add rule** to add the rule to the dial plan.

    Note: for more information about dial plans, refer to Understanding the Dial Plan.

Related Topics

- Making Calls with the ISDN gateway
- Understanding the Dial Plan

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Making Calls with the ISDN gateway

The ISDN gateway allows:

- users with ISDN endpoints to place calls to users with IP endpoints.
- users with IP endpoints to place calls to users with ISDN endpoints.

When configured correctly, the ISDN gateway is transparent to users; they will require minimal assistance and training to place calls through the ISDN gateway successfully.

One training consideration for users making ISDN calls which is not usually present for IP calls is that of cost; you may want to educate users that ISDN calls escalate in cost with increased bandwidth and duration. You may also want to configure the ISDN gateway to limit these values if required. (For more information, refer to Understanding the Dial Plan).

For information about setting up the ISDN gateway, refer to:

- the quick start guide.
- the installation guide.
- Getting Started with the ISDN gateway.

When you have the unit and associated devices (for example, the MCU) correctly configured, with an appropriate dial plan in place, calls can be placed through the ISDN gateway.

ISDN to IP Calls

If you have configured the dial plan as in Getting Started with the ISDN gateway, endpoints calling the phone number of the ISDN gateway will, once the call is completely established, be forwarded to the auto attendant of the MCU. From here they may use the Far End Camera Controls (FECC) of their endpoint to navigate the menus and join conferences as normal.

IP to ISDN Calls

An IP to ISDN caller needs to know the number of the ISDN user whom they are calling. However, if the call will be placed via a Codian MCU, the ISDN user's number can be incorporated into the configured endpoint details stored on the MCU.

You can configure the ISDN gateway to allow calls to a single ISDN number. In this case, a single rule in the dial plan will suffice, matching all numbers and calling out to a single phone number.

If you want users to be able to call any number, set the ISDN gateway up as a 'gateway' on your MCU and direct calls to ISDN numbers via that. Alternatively, if you are using a gatekeeper on your IP network, you can register a prefix with which users may prefix the ISDN number they want to call (this is similar to dialing a '9' for an external line on many telephone systems).

Related Topics

- Getting Started with the ISDN gateway
- Understanding the Dial Plan

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Using the ISDN gateway for Voice-Only Calls

The ISDN gateway can be used to forward voice-only IP calls to the ISDN network (the PSTN); likewise, it can be used to forward voice-only ISDN calls from the PSTN to IP telephones on the IP network. If you want to use the ISDN gateway to forward voice-only calls, there are two ways to configure this feature:

- **globally**:
  either
  - entirely as a voice-only gateway: where all IP calls and all ISDN calls are forwarded as voice-only calls

  or
  - partly as a voice-only gateway: where incoming ISDN video-conferencing calls are allowed, but outgoing ISDN calls are voice only (or vice-versa)
- **dial plan configuration**: where particular calls (ingoing and outgoing) are allowed to be video-conferencing calls, and where particular calls are restricted to voice-only

IP to ISDN calls: IP endpoints sometimes do not allow the caller to specify the type of call being made. For example, a caller may want to make a telephone call (that is, voice only), but are unable to specify that this is a telephone call. To overcome this problem, for IP data calls, if required, the ISDN gateway can extract the voice part of the call and forward it to the ISDN network as a voice-only call. For IP to ISDN calls, if the ISDN gateway receives a video-conferencing call that has been restricted to being a voice-only call (due to the settings on the ISDN gateway), the unit will forward it as a voice-only call (the call will not be dropped). If the IP endpoint does allow call type to be specified, an IP telephone call will always be placed as such.

ISDN to IP calls: ISDN endpoints usually allow a caller to specify the type of call being made. This is important, because with ISDN calls the voice part of the call cannot be separated from the video part. Therefore, if the ISDN gateway receives a video-conferencing call and the dial plan restricts the ISDN gateway to voice-only calls, the unit will drop the call. Voice-only telephone calls will always be accepted by the ISDN gateway.

Configuring the ISDN gateway as a Voice-Only Gateway

1. Go to **Home > Settings > ISDN**.
   - To configure the ISDN gateway to restrict incoming ISDN calls to voice-only calls, set the **Max outgoing ISDN call rate** to *Telephone*.
   - To configure the ISDN gateway to restrict outgoing ISDN calls to voice-only calls, set the **Max outgoing ISDN call rate** to *Telephone*.
2. Complete the other ISDN settings as per your requirements. For more information about the ISDN settings page, refer to Configuring General ISDN Settings.

Note: You can set both the incoming and outgoing maximum call rates to *Telephone* to use the ISDN gateway entirely as a voice-only gateway.

Dial Plan Configuration

You can configure the dial plan to restrict particular called numbers to voice-only calls. In this way, you can configure the ISDN gateway to allow particular outgoing/incoming ISDN calls to be video-conferencing calls. Using the dial plan therefore allows you greater flexibility (if you need it) than using the global settings on the ISDN settings page.

For more information about configuring the dial plan, refer to Understanding the Dial Plan, Adding and Updating Dial Plan Rules, and Example Dial Plan Rules.

Calling a PSTN Telephone from an MCU

If you want to call someone on a regular land-line telephone into a conference on the MCU, you must add the ISDN gateway as a participant, using one of the following methods:

- specifiy it as a gateway with an extension.
- call a particular number registered to a common gatekeeper.
- call the ISDN gateway by IP and let the ISDN gateway itself work out which number to call based on dial plan rules.

Whichever method you use, you must have a dial plan configured, such that a rule is invoked that has "Telephone" bandwidth, specified for the call. Then the call will be established correctly.

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Related Topics

- Getting Started with the ISDN gateway
- Configuring General ISDN Settings
- Understanding the Dial Plan
- Adding and Updating Dial Plan Rules

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Displaying ISDN Port Utilization

For each ISDN port, you can view details of any port activity for each ISDN channel. To display ISDN port utilization details, go to **ISDN** > **ISDN ports**. The following information is displayed for each channel of every ISDN port:

Field	Field Description
#	The ISDN channel number.
Activity	Whether or not this channel on this port is currently active. Activity is one of: • **inactive**: not in use. • **active (data)**: in use. A voice and video call is taking place and is using this channel. • **active (voice)**: in use. An audio-only call is taking place and is using this channel.
Direction	If the channel is active, the direction of the call is displayed. Either: • **inbound**: for calls to the ISDN endpoint. • **outbound**: for calls from the ISDN endpoint.
Calling party	The identity of the endpoint that initiated the call (depending on what that endpoint has provided): • for IP-ISDN calls (that is, outbound calls), this is the name of the H.323 device, the telephone number, or "Codian ISDN gateway". • for ISDN-IP calls (that is, inbound calls) this is the telephone number of the endpoint that made the call.
Called party	The number that was dialed by the calling party.

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Displaying the ISDN Calls List

The ISDN Calls List displays both active calls and completed calls on the ISDN gateway together with their basic settings. The list enables you to disconnect active calls and to delete completed calls from the list. For active calls, you can select to display further details (see Displaying Detailed Call Information).

Active calls are those calls that are taking place now. The active calls list shows *all* calls that are currently taking place. The maximum number of calls that can take place simultaneously is constrained by the ISDN bandwidth available to the ISDN gateway.

Completed calls are calls that have ended. The completed calls list shows only the most recent calls (up to 20 calls). Older calls are automatically deleted from the list.

To display the ISDN Calls List go to **Home** > **ISDN** > **ISDN Calls**.

Field	Field Description
Type	The type of call, which will either be "IP to ISDN" or "ISDN to IP".
Participants	The participants in the call. An IP participant will be listed by IP address. An ISDN participant will be listed by ISDN number.
Details	The time that the call started and its duration.
Progress	Progress is indicated for active calls only and can either be connected or connecting.

Disconnecting and Deleting Calls

To disconnect active calls, go to **ISDN** > **ISDN Calls**:

- To disconnect particular calls, select the calls you want to disconnect and click **Disconnect selected**.
- To disconnect all active calls, click **Disconnect all**.

To delete calls from the list of completed calls, go to **ISDN** > **ISDN Calls**:

- To delete particular calls from the list, select the calls you want to delete and click **Purge selected**.
- To delete all completed calls, click **Purge all**.

Related Topics

- Displaying Detailed Call Information

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Displaying Detailed Call Information

Active calls are listed with some details in the ISDN Calls List (see Displaying the ISDN Calls List). To view further details about an active call, go to **ISDN** > **ISDN Calls** and click **more** for the call about which you want more information.

On the Call details page, the call for which more details are provided, is displayed with a number (example: "Call 15 details"). This number is generated by the ISDN gateway (numerically, starting from zero since the last reboot) for the purposes of internal identification.

Field	Field Description
Started at	For IP to ISDN calls, this is the time that the call was received by the ISDN gateway. For ISDN to IP calls this is the time that all the channels comprising the call have connected and bonded.
Call progress	The status of the call, which will be one of: • **Initial**: an IP or ISDN call has just come in, and the ISDN gateway is determining if it is allowed and where to direct it. • **Calling out**: the ISDN gateway is trying to make contact with the other side of the call. • **Connected**: the call is in progress between and IP and and ISDN endpoint. • **Dying**: You might notice this state briefly as a call is terminated, either by one of the participants or via the web interface. Call progress also lists the caller's number and the number that was called and the destination, including IP address for an IP destination.
Participant details	
Name	The name the caller provided when the call was initiated.
E.164	The telephone number of the participant.
Call type	The participant's call type: either H.320 (ISDN caller) or H.323 (IP caller).
FECC	Whether *Far-End Camera Control* has been established or not.
Progress	The status of the participant's side of the call, which will be one of: • **Initial**: the call is just starting. • **Proceeding**: trying to make contact with the other side of the call. • **Alerting**: the other side of the call is ringing (you might not see this state). • **Connected**: the call is in progress. • **Disconnecting**: the call is in the process of going down. • **Finished**: the call is disconnected (you might not see this state).
Channel bonding map	Only for ISDN participants: The numbers of the ISDN channels that are in use for this call.

Related Topics

- Displaying the ISDN Calls List

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Understanding the Dial Plan

The ISDN gateway uses the dial plan to determine how to route calls between IP and ISDN networks. When the ISDN gateway receives a request to initiate a new IP to ISDN or ISDN to IP call, it examines the called number (if available), and uses the dial plan to determine whether to reject the call, find out which number should be called to initiate the outgoing part of the call, and check the allowed call bandwidth.

There are a number of different ways in which you can use the dial plan. For example, you can use the dial plan to enable users to use a particular bandwidth for an IP to ISDN call. You can also use the dial plan to enable the ISDN gateway to join incoming ISDN calls to the correct conference on an MCU. (For example dial plans, refer to Example Dial Plan Rules.)

The dial plan is actually divided into two; an IP to ISDN dial plan and an ISDN to IP dial plan. If the incoming part of a connection is from an IP endpoint, the IP to ISDN dial plan is used; from an ISDN endpoint, the ISDN to IP dial plan is used. The behavior of the two dial plans is near identical, and the sections below only make a distinction between the two where differences exist.

Refer to the sections below for more information about the use and administration of dial plans:

- Rules
- Using Rules
- Rule Ordering

Rules

Dial plans are administered using *rules*. Rules and their addition and control are near identical for the IP to ISDN and ISDN to IP dial plans.

Each rule comprises the following three parts:

- a **condition** that must be matched for the rule to be invoked.
  The condition can be set to match any called number, to match a call that has no called number, or can specify the called number by specific number or pattern.
- an **action** that is carried out if the rule is invoked.
  The action can be to reject the call, to place the call using the original dialed number, or to specify the number/address to call.
- a set of **additional parameters** that modify the action:
  - Call type: use this option to specify whether the call is a normal video call, a telephone call, or a video call that supports legacy ISDN endpoints that use n x 64kbps.
  - Maximum bandwidth: use this option to limit the bandwidth available to for calls to particular numbers, or to allow users to select their own bandwidth (for more information, see Adding and Updating Dial Plan Rules).
  - ISDN port: use this option if you need to specify the ISDN port for a particular type of call.

Using Rules

Each dial plan comprises a set of rules. When the ISDN gateway receives a new incoming call, it selects the appropriate dial plan, then compares the called number (if available) to the condition of each rule in that dial plan until a match is found. When a match is found, no more rules are checked, and the action of the matching rule is used to determine what should be done next; typically the outgoing part of the connection will be initiated, calling a number specified by the action, or the connection will be rejected and the incoming part terminated.

If a dial plan contains no rules, or if no rules' conditions match the called number calls are rejected by default.

For more information on adding and modifying dial plan rules, see Adding and Updating Dial Plan Rules.

Rule Ordering

Rules are always checked in the same order for each incoming call. This means a dial plan may be designed to handle specific calling cases first, then general calls if no specific cases match. For example, a dial plan may be set up to call a particular person's endpoint if an incoming call is received to a specific number, but all other incoming calls get connected to an operator's endpoint. Such a dial plan might look like this:

1. Condition: **Called number is "6056"** / Action: **Call with the original called number**.

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2. Condition: **Match any called number** / Action: **Call this number "1000"**

Clearly rule ordering is important to achieve this functionality. You can view and test the rule list comprising a dial plan, and modify the ordering of the rules as required. For more information, see Displaying and Testing the Dial Plan.

Related Topics

- Making Calls With the ISDN gateway
- Displaying and Testing the Dial Plan
- Adding and Updating Dial Plan Rules
- Example Dial Plan Rules
- Dial Plan Syntax

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Displaying and Testing the Dial Plan

The dial plan is actually made up of two, separate dial plans. One for IP to ISDN calls, and one for ISDN to IP calls. The use and administration of these two dial plans is near identical. Refer to the sections below for more information.

To display or modify the IP to ISDN dial plan, go to **Home > Dial plan > IP to ISDN**. To display or modify the ISDN to IP dial plan, go to **Home > Dial plan > ISDN to IP**.

- Displaying the Rules List
- Modifying Rules List
- Testing the Dial Plan

Displaying the Rules List

As described above, the dial plan comprises a set of rules that are followed in response to the incoming part of a connection, in order to determine how to proceed with the outgoing part of the connection.

You can view the set of rules comprising a dial plan, they are shown as a list, with rules checked from top to bottom. Refer to the table below for details of the fields displayed.

Field	Field Description	More Information
# (number)	Displays the unique number assigned to this rule.	Click on a number to view and modify rule details (see Adding and Updating Dial Plan Rules).
Condition	Displays which called numbers will cause this rule to be invoked.	Possible conditions include: • **Called number is "1025"** meaning this rule is invoked if the called number is exactly as stated • **No called number** meaning this rule is invoked if the incoming part of the call has no called number available • **Match any called number** meaning this rule is always invoked if checked
Action	Displays what will happen if this rule is invoked.	Possible actions include: • **Call this number "xxx"**: where xxx represents what is displayed: ◦ for IP to ISDN calls: a number or a pattern ◦ for ISDN to IP calls: a pattern, a hostname, or an IP address meaning that "xxx" will be called if this rule is invoked. • **Call with the original called number**: the original called number will be used to place the outgoing part of the call. • **Reject the call**: meaning that if this rule is invoked the call is terminated and the outgoing part of the call is not established • **Call these numbers**: meaning that this is a video call using N x 64 kbps (for legacy ISDN endpoints only). The first two numbers to be called are listed here; click the dial plan number to view the complete list of numbers included in this rule.

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Bandwidth	The maximum ISDN bandwidth that will be used for the call if this rule is invoked.	The value will be one of: • **Telephone**: meaning that the call will be restricted to voice-only. • **Number of Kbps**: the maximum bandwidth allowed for calls matching this rule. • **<default>**: meaning that the default maximum bandwidth setting is used. To configure the default bandwidth go to **Home > Settings > ISDN** • **N x 64kbps**: meaning that the call is a video call using N x 64 kbps (for legacy ISDN endpoints only).
Port	For IP to ISDN only: The ISDN port on which the call will be placed.	This is an optional setting. The default value is <**any**>. However, you may set a port if required. For example, you may decide to have all incoming ISDN calls on one port and all outgoing ISDN calls on another port.
*** (asterisk)**	Identifies the rule you have just added.	If you have just added or moved a rule in the list, it will be marked with an asterisk (*). This is to help you see the chnages you have made.
Move	Use "Up" and "Down" to re-order the rules within the list.	Remember that the ISDN gateway checks calls against the dial plan starting at the top of the list of rules. The first rule to match the condition of the call will be invoked. Place rules with specific conditions at the top of the list. Place rules with general conditions (for example, **Match any called number**) at the bottom of the list.

Modifying the Rules List

To change the order of rules, use the **up** and **down** links.

To add a rule, click **Add rule** (see Adding and Updating Dial Plan Rules).

To remove a rule, select one (or more) and click **Delete selected rules**.

Testing the Dial Plan

It may take some experimentation to create the dial plan that you require. The ISDN gateway provides a facility so that you can test the dial plan to see how your set of rules acts on a particular number.

To test the dial plan:

1. Go to **Home > Dial plan**.
2. If you want to test how the dial plan acts
   - on a particular number or address for an ISDN to IP connection, ensure you are on the **ISDN to IP dial plan** tab.
   - on a particular number for an IP to ISDN connection, ensure you are on the **IP to ISDN dial plan** tab.
3. In the **Test dial plan** section, enter the number to test and click **Test number**.

The ISDN gateway displays the number that you have tested, the rule that the condition matched, the outcome (that is, whether the call was rejected or the number that has been dialed in response), and the bandwidth used.

Related Topics

- Adding and Updating Dial Plan Rules
- Making Calls With the ISDN gateway
- Example Dial Plan Rules

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- Dial Plan Syntax

Adding and Updating Dial Plan Rules

This page describes how to add rules to the dial plan. It also tells you how to update rules. Note that you may also find it very helpful to refer to Example Dial Plan Rules.

Adding Dial Plan Rules

To add a dial plan rule:

1. Go to **Home > Dial Plan**. If you want to add an
   - IP to ISDN rule, ensure you are on the **IP to ISDN** tab.
   - ISDN to IP rule, ensure you are on the **ISDN to IP** tab.
2. Click **Add rule**.
3. Configure the condition for the rule. Choose one of:
   - **Match any called number**: this condition matches any called number and also includes calls where the called number is not known or unavailable. Generally, this kind of rule should be used towards the bottom of the dial plan list to match numbers not recognized by more specific rules higher up.
   - **No called number**: this condition matches only when the called number is not known or unavailable.
   - **Called number matches**:
     - To match a specific number, enter that specific number.
       Example: to match calls to "001234", type **001234**. The condition will match that and only that number.
     - To match a more general number, use the wildcard character, **D**. This means any digit will do.
       Example: to match any number that starts with "55" followed by exactly two more digits, type **55DD**. This condition will match "5500", "5523", "5555", "5599", etc. but not "55" or "55233".
     - For more general matching, you may use one of the three repeat characters. These modify the character immediately before, whether it is a specific digit or the wildcard character. The repeat characters are:
       ? match once or zero times.
       + match once or more.
       ***** match zero or more times.
       For example, "5+" means " match at least one 5, but possibly more".
       "D*" means "match any digit, any number of times".
       Example: to match any number that starts with "01", has any amount of digits in the middle, and ends with "5", type **01 D* 5**.
     - To include any of the incoming called digits in the outgoing called number, enclose them in parentheses. Note that if you wish to include the complete number, you do not need to enclose the whole expression in parentheses.
       Example: to match any number starting with "678", then followed by three or four digits, and you wish the final digits to form part of the called number, type the expression: **678 (DDDD?)**. This will match "6780000", "678123", "6789999" etc. but not "67822" or "775000".
4. Configure the action for the rule (that is, what happens to the outgoing part of the call in the event of this rule being invoked). Choose one of:
   - **Reject the call {}**: the call will be terminated and the outgoing part of the call will not be established.
   - **Call with the original called number**: the outgoing part of the call will be placed to the number that was the original called number. For example, an incoming ISDN call to "54321" will result in an outgoing call placed over IP to "54321".
   - **Call this number**: the number that is entered here will be to where the outgoing call is placed. Type a number, or for ISDN to IP rules you can also type an IP address or hostname.
     - To call a specific number (or for ISDN to IP calls, you can also specify an IP address or hostname), type that number (or IP address or hostname).
       Example: to specify that when this rule is invoked, the MCU with hostname my_mcu is called, type **my_mcu**.
     - To call a specific extension, separate the number/address from the extension by typing a colon (:).
       Example: to call the Codian MCU with IP "10.2.1.33", and try to join a conference with

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numeric identifier "00000", type **10.2.1.33 : 00000**.

- To include any of the digits from the incoming called number in the outgoing number, specify a substitution, by typing the dollar sign ($), followed by a index. Valid indices are:
  A: substitute the entire incoming called number.
  1: substitute the digits enclosed in the first set of parentheses of the condition.
  2: substitute the digits enclosed in the second set of parentheses of the condition.
  3: substitute the digits enclosed in the third set of parentheses of the condition.
  4: substitute the digits enclosed in the fourth set of parentheses.

  Example: for all calls matching the condition of "55 (DDDD)", set an action to call the MCU with name "my_mcu" and join the call to the conference with identifier that matches "(DDDD)". For this example, type the action of **my_mcu : 00 $1**. In this case, an incoming call to "551234" will attempt to join conference with numeric identifier "001234" on the Codian MCU with the name "my_mcu".

- **Call these numbers**: this option only becomes available if you select *Video using n x 64kbps (legacy)* as the call type (for IP to ISDN calls) in the **Additional parameters** section. Only use *Video using n x 64kbps (legacy)* if you are supporting legacy ISDN endpoints that need this feature. You must ensure you enter the correct number of telephone numbers. For example, if you select 3 x 64kbps as the call bandwidth, you must enter three telephone numbers here. Note that you must enter the actual numbers, rather than using any substitutions.

5. Configure additional parameters, if required:
   - **Call type**: Specify the type of outgoing call from:
     - **Telephone**: if the call is a voice-only telephone call.
     - **Video using BONDING (default)**: a "typical" video call.
     - **Video using N x 64kbps (legacy)**: only select this if you need to support legacy ISDN endpoints that require n x 64kbps channels. This option is only available for IP to ISDN calls
   - **Call bandwidth**: optionally, select a maximum bandwidth for the ISDN part of the call, which will otherwise be set to the default value. To view or edit the default value, go to **Home > Settings > ISDN**. The maximum bandwidth settings on the **Home > Settings > ISDN** page are global settings. Therefore, if you choose a greater setting in the dial plan than you have as a global setting, the global setting will be used as the maximum value. For example, if in the dial plan you choose to set *320kbps (5 x B channels)* as the maximum bandwidth and the global setting for maximum bandwidth for outgoing ISDN calls is *256kbps (4 x B channels)*, the maximum bandwidth available to the call will never be more than 256kbps.

     Note that if you have selected *Telephone* as the call type, this option is unavailable.

     Note that if you have selected *Video using n x 64kbps (legacy)* as the call type, you must ensure you select a bandwidth that matches the number of telephone numbers that you have entered.
   - **Place call on**: optionally, select the ISDN port on which the call will be placed. For example, you may decide to have all incoming ISDN calls on one port and all outgoing ISDN calls on another port.
6. Click **Add rule**.

Updating Dial Plan Rules

To update an existing dial plan rule:

1. Go to **Home > Dial Plan** and find the rule you want to modify (either in the IP to ISDN dial plan or in the ISDN to IP dial plan, depending on to which dial plan the rule belongs).
2. Click on the number of the rule to view and modify rule details.
3. Use the information listed above in Adding Dial Plan Rules to help you update the rule.

Related Topics

- Making Calls With the ISDN gateway
- Using the ISDN gateway for Voice-Only Calls
- Understanding the Dial Plan
- Displaying and Testing the Dial Plan
- Example Dial Plan Rules
- Dial Plan Syntax

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Example Dial Plan Rules

Use the examples on this page to help you configure your own dial plan rules:

- Allocating Bandwidth Using Rules for IP to ISDN calls
- Allocating Bandwidth Using Rules for ISDN to IP calls
- Forwarding ISDN Calls to an Operator or a Conference
- Specifying Voice-only IP Telephone Calls

Allocating Bandwidth Using Rules for IP to ISDN calls

Using rules, it is possible to limit the bandwidth available for calls to particular numbers, or to allocate more bandwidth to priority calls. For example, you may want to allocate maximum bandwidth to calls to the chief executive of your company. In this case, set a condition that matches calls to that specific number, set the action to call with the original called number, and set the call bandwidth to use 768kbps.

As cost is an issue with calls to the ISDN network, you may want to provide users with a list of prefixes that they can use to control the bandwidth for the calls they make. In this way, rules enable you to allow users to select their own appropriate bandwidth for a call. The table below shows some rules that you could configure to set up different prefixes to represent the number of channels that will be available to the call. It also shows how the IP to ISDN dial plan will remove those prefixes and dial the required number.

#	Condition	Action	Call type	Bandwidth	Description
0	Called number matches "552 (D*)"	Call this number "$1"	Video with BONDING	128Kbps	This rule allocates 128kbps (that is, 2 channels) to any call with prefix 552. The specified action means that the dial plan removes the prefix and dials the following group of numbers in the condition. For example, an incoming call to "55264321" will cause an outgoing call allocated with 2 channels to be placed to "64321".
1	Called number matches "553 (DDDD)"	Call this number "$1"	Video with BONDING	192Kbps	This rule allocates 192kbps (that is, 3 channels) to any call with prefix 553. The specified action means that the dial plan removes the prefix and dials the group of four numbers that match the four digits represented by "(DDDD)" in the condition. For example, an incoming call to "5539876" will cause an outgoing call allocated with 3 channels to be placed to "9876".
2	Called number matches "558 (DDDD)"	Call this number "$1"	Video with BONDING	512Kbps	This rule allocates 512kbps (that is, 8 channels) to any call with prefix 558. The specified action means that the dial plan removes the prefix and dials the group of four numbers that match the four digits represented by "(DDDD)" in the condition. For example, an incoming call to "5585678" will cause an outgoing call allocated with 8 channels to be placed to "5678".

Note that in the above example, in the absence of any further rules, any calls that do not match the three listed conditions, will be rejected as that is the default behavior of the dial plan.

Allocating Bandwidth Using Rules for ISDN to IP calls

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Using rules, it is possible to limit the bandwidth available for incoming ISDN calls. This is useful where you want to limit the network resources available to individual calls. In this way, you can prevent any one calls using the resources to the extent that other incoming calls are prevented.

#	Condition	Action	Call type	Bandwidth	Description
0	Match any called number	Call with the original called number	Video with BONDING	384Kbps	This rule forwards all calls to the dialed number with a bandwidth of 384Kbps

Forwarding ISDN Calls to an Operator or a Conference

The dial plan below forwards any calls from the ISDN network ending in 0000 to an operator and forwards any other dialed number of four digits or more to the MCU to join a conference where the conference identifier is the last four digits of the original dialed number.

The dial plan shown below is an ISDN to IP dial plan:

#	Condition	Action	Call type	Bandwidth	Description
0	Called number matches "D + 0000"	Call this number "10.2.1.10"	Video with BONDING	384Kbps	This rule catches any number ending in 0000 and forwards it to, for example an operator, at 10.2.1.10
1	Called number matches "D +(DDDD)"	Call this number "10.2.1.20 : $1"	Video with BONDING	384Kbps	This rule catches any number of four digits or more and tries to join a conference on the MCU at 10.2.1.20 with the numeric identifier that matches the last four digits.

Specifying Voice-only IP Telephone Calls

Use the dial plan to specify how IP telephone calls (that is voice-only calls) will be forwarded to the ISDN network.

IP endpoints sometimes do not allow users to specify the type of call being made. The following dial plan shows that users can be told the prefix to dial, should their call be a telephone call rather than a video and voice call.

The dial plan shown below is an IP to ISDN dial plan:

#	Condition	Action	Call type	Bandwidth	Description
0	Called number matches "550 (D+)"	Call this number "$1"	Telephone	None	This rule specifies a voice-only call to any call with prefix 550. The specified action means that the dial plan removes the prefix and dials the group of numbers that match the digits represented by "(D+)" in the condition. For example, an incoming call to "5504321" will cause an outgoing voice-only call to be placed to "4321".
1	Match any called number	Call with original called number	Video with BONDING	128Kbps	This rule catches any other called number and will place it as a video-conferencing call (that is video and voice) using the lowest bandwidth.

Related Topics

- Making Calls With the ISDN gateway
- Using the ISDN gateway for Voice-Only Calls
- Understanding the Dial Plan
- Adding and Updating Dial Plan Rules
- Displaying and Testing the Dial Plan
- Dial Plan Syntax

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Dial Plan Syntax

This page describes the syntax that you can use when adding dial plans.

Syntax for Conditions (*Called number matches*)

When you configure the condition for a dial plan rule, you may want to specify a pattern for the called number rather than specifying any of: called number, no called number or the exact called number.

The table below describes the syntax you can you to express a pattern for the *Called number matches* field in the condition of a rule:

Syntax	Description	Example
Numbers 0 to 9	To match a specific number, enter that number.	Example: to match calls to "001234", type 001234. The condition will match that and only that number.
D	To match any digit, use the wildcard character **D**	Example: to match any number that starts with "623" followed by exactly two more digits, type 623DD. This condition will match "62300", "62323", "62355", "62399", etc. but not "623" or "623233".
?	To match once or zero times, use **?**	Example: "6?" means match one 6 or no 6s, and is useful when used with the wildcard "**D**" where you do not know how long a number will be. The expression: "67800D?" will match "67800" and "678004" but not "67800666".
+	To match once or more, use **+**	Example: "5+" means "match at least one 5, but possibly more".
*****	To match zero or more times, use *****. This is useful when used with the wildcard: "D*" means "match any digit, any number of times".	Example: to match any number that starts with "01", has any amount of digits in the middle, and ends with "5", type **01 D* 5**.
()	Parentheses indicate substitution groups. To include any of the incoming called digits in the outgoing called number, enclose them in parentheses. Note that if you wish to include the complete number, you do not need to enclose the whole expression in parentheses.	Example: to match any number starting with "678", then followed by a number of other digits, and you wish the final digits to form part of the called number, type the expression: 678 (D*). This will match "6780000", "678123", "6789999" etc. but not "775000".

Syntax for Actions (*Call this number*)

When you configure the action for a dial plan rule, you may want to specify a pattern for the number to call, rather than specifying any of: call original called number, reject the call, or the exact number to call.

The table below describes the syntax you can use to express a pattern for the *Call this number* field in the action of a rule:

Related Topics

- Making Calls With the ISDN gateway
- Using the ISDN gateway for Voice-Only Calls
- Understanding the Dial Plan
- Example Dial Plan Rules
- Adding and Updating Dial Plan Rules
- Displaying and Testing the Dial Plan

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Syntax	Description	Example
Letters and numbers for address	To call a specific number (or for ISDN to IP calls, you can also specify an IP address or hostname), type that number (or IP address or hostname).	Example: to specify that when this rule is invoked, the MCU with hostname my_mcu is called, type **my_mcu**.
:	To call a specific extension, separate the number/address from the extension by typing To call a specific extension, separate the number/address from the extension by typing a colon (**:**).	Example: to call the Codian MCU with IP "10.2.1.33", and try to join a conference with numeric identifier "00000", type **10.2.1.33 : 00000**.
$	To include any of the digits from the incoming called number in the outgoing number, specify a substitution, by typing the dollar sign ($), followed by a index. Valid indices are: **A**: substitute the entire incoming called number. **1**: substitute the digits enclosed in the first set of parentheses of the condition. **2**: substitute the digits enclosed in the second set of parentheses of the condition. **3**: substitute the digits enclosed in the third set of parentheses of the condition. **4**: substitute the digits enclosed in the fourth set of parentheses.	Example: for all calls matching the condition of "55 (DDDD)", set an action to call the MCU with name "my_mcu" and join the call to the conference with identifier that matches "(DDDD)". For this example, type the action of **my_mcu : 00 $1**. In this case, an incoming call to "551234" will attempt to join conference with numeric identifier "001234" on the Codian MCU with the name "my_mcu". Note that if the substitution creates an empty number, the call will be rejected; in the above example, an incoming call to 55 would result in an empty substitution.

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Displaying the User List

The User List gives you a quick overview of the configured users on the ISDN gateway and a brief overview of some of their settings. To display this list, go to **Home > Users**. Refer to the table below for assistance.

Field	Field Description
User ID	Shows the log-in name that the user will use to access the ISDN gateway web browser. Click on a name for further details (see Updating Users).
Name	Shows the full name of the user where appropriate.
Privilege	Displays the access privileges associated with this user. An *administrator* can change any ISDN gateway configuration, and view all status information; a user with *list only* privilege may only view basic details about active calls.

Related Topics

- Updating Users

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Adding Users

Follow these steps to add a user:

1. Go to **Home > Users**.
2. Click **Add new user**.
3. Refer to the table below to determine the most appropriate settings for the user.
4. After entering the settings, click **Add user**.

Field	Field Description	More Information
User ID	Identifies the log-in name that the user will use to access the ISDN gateway web browser.	
Password	Type the required password.	
Re-enter password	Re-type the required password.	
Privilege level	Specifies the access privileges to be granted to this user.	An *administrator* can change any ISDN gateway configuration, and view all status information; a user with *list only* privilege may only view basic details about active calls. All users may view online help documentation.

Related Topics

- Displaying the User List

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Updating Users

Follow these steps to update an existing user:

1. Go to **Home > Users**.
2. Click a user name.
3. Refer to the table below to determine the most appropriate settings for the user.
4. After entering the settings, click **Update user settings**.

Field	Field Description	More Information
User ID	Identifies the log-in name that the user will use to access the ISDN gateway web browser.	
Password	Specifies any required password.	
Re-enter password	Verifies the required password.	
Privilege level	Specifies the access privileges to be granted to this user.	An *administrator* can change any ISDN gateway configuration, and view all status information; a *guest* may only view basic details about active calls. All users may view online help documentation.

Related Topics

- Viewing the User List

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Configuring Network Settings

You can configure the network settings on the ISDN gateway and check the network status by choosing **Home > Settings > Network A** or **Home > Settings > Network B**

The ISDN gateway has two Ethernet interfaces, *Port A* and *Port B*. The configuration pages for the two interfaces look and behave similarly, and so are described together. Differences will be noted as appropriate.

NOTE: Port B cannot be enabled on the Codian ISDN gateway

- IP Configuration
- IP Status
- Ethernet Configuration
- Ethernet Status

IP Configuration Settings

These settings determine the IP configuration for the appropriate Ethernet port of the ISDN gateway. When you have finished, you must press **Update IP configuration** to make any changes take effect.

Field	Field Description	Usage Tips
Port enabled	Specifies whether the port is enabled or disabled. When enabled, the port will allow IP traffic to flow; when disabled, IP traffic will not pass into or out of the ISDN gateway on this port	Port A can never be disabled, as it is the primary interface of the ISDN gateway.
Host name	Specifies a name for the ISDN gateway.	Depending on your network configuration, you may be able to use this host name to communicate with the ISDN gateway, without needing to know its IP address.
IP configuration	Specifies whether the ISDN gateway obtains its own IP address for this port automatically via DHCP (Dynamic Host Configuration Protocol), or whether you want to specify fixed values.	Press the **Renew DHCP** button to request a new IP address if you have selected automatic configuration. Only *manual* IP configuration may be used with Port B.
Manual Configuration		
IP address	Identifies the dot-separated IPv4 address for this port, for example 192.168.4.45	You only need to specify these options if you have chosen *manual* IP configuration, as described above.
Subnet mask	Identifies the subnet mask required for the IP address you wish to use, for example 255.255.255.0	
Default gateway	Identifies the IP address of the default gateway on this subnet, for example 192.168.4.1	
Name server (DNS)	Identifies the IP address of the name server.	
Secondary name server (DNS)	Identifies specify an optional second name server.	

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Domain name (DNS suffix)	Specifies an optional suffix to add when performing DNS lookups.	This can allow you to use non-fully qualified host names when referring to a device by host name instead of IP address. For example, if the domain name is set to *codian.com*, then a request to the name server to look up the IP address of host *endpoint* will actually lookup *endpoint.codian.com*.

IP Status

Use the IP Status fields to quickly verify the current IP settings for the appropriate Ethernet port of the ISDN gateway, which were obtained using DHCP or configured manually (see IP Configuration Settings) including:

- Host name
- DHCP
- IP address
- Subnet mask
- Default gateway
- Name server (DNS)
- Secondary name server (DNS)
- Domain name (DNS suffix)

Ethernet Configuration

These settings determine the Ethernet settings for the appropriate port of the ISDN gateway. Refer to the table for assistance with these settings. When you have finished, you must press **Update Ethernet configuration** to make the changes take effect.

Field	Field Description	Usage Tips
Ethernet settings	Specify whether you want this Ethernet port to automatically negotiate its Ethernet settings with the device it is connected to, or if it should obtain its configuration manually using fixed values that you must specify.	It is important that your Ethernet settings match those of the device to which this port is connected. For example, both devices must be configured to use automatic negotiation, or both configured with fixed and matching speed and duplex settings (see below).
Manual Configuration		
Speed	Identifies the connection speed: *10 Mbit/s*, *100 Mbit/s* and *1000 Mbit/s*.	The connection speed must match that of the device to which this port is connected. You only need to select this option if you have chosen *manual* Ethernet settings, as described above.
Duplex	Identifies the connection duplex mode: • **Full duplex** Both devices can send data to each other at the same time • **Half duplex** Only one device can send to the other at a time	The duplex setting must match that of the device to which this port is connected. You only need to select this option if you have chosen *manual* Ethernet settings, as described above.

Ethernet Status

Field	Field Description	Usage Tips
Link status	Indicates whether this Ethernet port is connected to or disconnected from the network.	

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Speed	Shows the speed (*10*/*100*/*1000 Mbit*/*s*) of the network connection to the ISDN gateway on this port.	This value is negotiated with the device to which this port is connected or based on your manual configuration, depending on the settings you chose above.
Duplex	Shows the duplex mode (*full*/*half duplex*) of the network connection to this port.	This value is negotiated with the device to which this port is connected or based on your manual configuration, depending on the settings you chose above.
MAC address	Shows the fixed hardware MAC (Medium Access Control) address of this port.	This value cannot be changed and is for information only.
Packets sent	The total number of packets sent from this port by the ISDN gateway since the last reboot. This includes all TCP and UDP traffic.	When troubleshooting connectivity issues, this information can help you confirm that the unit is transmitting packets into the network.
Packets received	The total number of packets received by this port of the ISDN gateway since the last reboot. This includes all TCP and UDP traffic.	When troubleshooting connectivity issues, this information can help you confirm that the unit is receiving packets from the network.
Multicast packets sent	The total number of multicast packets sent since the last reboot.	Use this field for advanced network diagnostics.
Multicast packets received	The total number of multicast packets received on this port since the last reboot.	Use this field for advanced network diagnostics.
Total bytes sent	The total number of bytes sent on this port since the last reboot.	Use this field for advanced network diagnostics.
Total bytes received	The total number of bytes received on this port since the last reboot.	Use this field for advanced network diagnostics.
Receive queue drops	The total number of packets dropped from the receive queue on this port since the last reboot, due to there being a full queue.	Use this field for advanced network diagnostics.
Collisions	The total number of packets re-transmitted because of Ethernet collisions since the last reboot.	Use this field for advanced network diagnostics.
Transmit errors	The total number of times the port failed to transmit data since the last reboot.	Use this field for advanced network diagnostics.
Receive errors	The total number of times the port received invalid packets or did not receive data due to a lack of system resources since the last reboot.	Use this field for advanced network diagnostics.

Related Topics

- Configuring IP Routing Settings
- Upgrading the Firmware

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Configuring IP Routing Settings

If both Ethernet ports are enabled, you will need to set up one or more routing settings to control how IP traffic flows in and out of the ISDN gateway. It is important that these settings are configured correctly, or you may be unable to make calls to or from the ISDN gateway or access the web interface.

To configure the IP routing settings go to **Home > Settings > Routes**.

NOTE: Port B cannot be enabled on the Codian ISDN gateway

- Port Preferences
- IP Routes Configuration
- Current IP Status

Port Preferences

If both Ethernet ports are enabled, it is necessary to specify which port is used in certain special circumstances. Make the appropriate selections described below, then press **Apply changes** to make any changes take effect.

Field	Field Description	Usage Tips
Default gateway preference	The default gateway specifies the IP address to which the ISDN gateway will send packets in the absence of more specific routing (see IP routes configuration). Therefore, it only makes sense to have precisely one default gateway, even though *different* default gateways may have been configured for Ports A and B. Use this option to decide which port's default gateway configuration to use as the unit's default gateway.	If Ethernet Port B is disabled, it will not be possible to specify that port as the default gateway preference. Selecting Port B as default gateway preference then disabling Port B will cause the preference to revert to Port A.
Name server (DNS) preference	The name server specifies the IP address to which the ISDN gateway will send requests to look up unrecognized host names in order to determine their corresponding IP addresses. Only one name server (and associated secondary name server) may be used, even though *different* name servers may have been configured for Ports A and B. Use this option to decide which port's name server configuration to use as the unit's name server.	If Ethernet Port B is disabled, it will not be possible to specify that port as the name server preference. Selecting Port B as name server preference then disabling Port B will cause the preference to revert to Port A.

IP Routes Configuration

The controls in this section allow control over how IP packets should be directed out of the ISDN gateway. You should only change this configuration if you have a good understanding of the topology of the network(s) to which the ISDN gateway is connected.

Configuration of routes is divided into two sections: addition of new routes, and the display and removal of existing routes.

Adding a New IP Route

To add a new route, first enter the details using the table below for reference. When you are satisfied with the details entered, press **Add IP route** to make the addition. If the route already exists, or aliases (overlaps) an existing route, you will be prompted to correct the problem and try again.

Field	Field Description	Usage Tips

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IP address / mask length	Use these fields to define the type of IP addresses to which this route applies. The IP address pattern must be in the dot-separated IPv4 format, while the mask length is chosen from a drop-down list The mask field specifies how many bits of the address are fixed; unfixed bits must be set to zero in the address specified.	To route all IP addresses in the range 192.168.4.128 to 192.168.4.255 for example, specify the IP address as 192.168.4.128 and the mask length as 25, to indicate that all but the last seven bits address are fixed.
Route	Use this field to control how packets destined for addresses matching the specified pattern are routed. You may select **Port A**, **Port B** or **Gateway**. If the latter option is selected, you must specify the IP address of the gateway you wish packets to be directed to.	Selecting Port A results in matching packets being routed to Port A's default gateway (see Configuring Network Settings). Selecting Port B will cause matching packets to be routed to Port B's default gateway. If Ethernet Port B is disabled, the option to route packets to Port B will be disabled.

Viewing and Deleting Existing IP Routes

Configured routes are listed below the *Add IP route* controls. For each route, the following details are shown:

- The IP address pattern and mask
- Where matching packets will be routed, with the possibilities being:
  - **Port A** - meaning the default gateway configured for Port A
  - **Port B** - meaning the default gateway configured for Port B
  - **<IP address>** - a specific address has been chosen.
- Whether the route has been configured automatically as a consequence of other settings, or added by the user as described above.

The *default* route is configured automatically in correspondence with the *default gateway preference* field (see Port preferences) and cannot be deleted. Any packets not covered by manually configured routes will be routed according to this route.

Manually configured routes may be deleted by selecting the appropriate checkbox and pressing **Delete selected**.

Routes Behavior with Disabled Ports

If the default gateway preference is set to Port B (for example) and that port is disabled, the *default* route will be updated automatically to route packets not covered by any manually configured route via Port A.

If a manually configured route specifies Port B (for example) and that port is disabled, packets matching that route **will not** be automatically be routed via Port A, but discarded. You should take care to avoid this situation.

Current IP status

This table shows the current default gateway and name server(s) for Ethernet Ports A and B. No fields can be changed, and are provided for reference when configuring the other parameters described in the sections above.

Related Topics

- Configuring Network Settings

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Configuring IP Services Settings

The Codian ISDN gateway offers a range of IP-based services, such as the web interface, FTP access for managing configuration, and H.323 for making and receiving calls. Depending on the security requirements of your network, it is possible to control which services may be accessed on Ethernet ports A and B, and optionally change the TCP (or UDP) ports they may be accessed on.

To configure the IP services settings go to **Home > Settings > Services**.

NOTE: Port B cannot be enabled on the Codian ISDN gateway

Field	Field Description	Usage Tips
Web	Use this option to enable or disable web access on the appropriate port.	Web access is required to view and change the ISDN gateway web pages and read online help files. If you disable web access on both Ports A and B, you will need to use the serial console interface to re-enable it. If a port is disabled, this option will be unavailable.
Incoming H.323	Use this option to allow or reject incoming calls to the ISDN gateway using H.323.	Disabling this option will not prevent outgoing calls to H.323 devices being made by the ISDN gateway . If a port is disabled, this option will be unavailable.
FTP	Use this option to enable or disable FTP access on the appropriate port.	You should consider disabling FTP access on any port that is outside your organization's firewall. If a port is disabled, this option will be unavailable.

Related Topics

- Configuring Network Settings

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Configuring General ISDN Settings

These settings are global settings which affect the configuration of the ISDN gateway with regard to ISDN network type and options, as well as allowed call features. To access these settings, choose **Home > Settings > ISDN**.

Note that some ISDN configuration must be done on a port-by-port basis; see Configuring ISDN Ports Settings.

Refer to the sections below for assistance configuring the general ISDN settings. After making any changes, click **Apply changes**.

Basic settings

Field	Field Description	Usage Tips
ISDN interface type	Identifies the ISDN network type to which the ISDN gateway is connected. Choose from *E1*, *T1 (USA and Canada)*, and *T1 (Japan)* as appropriate.	E1 is usually used in the UK and mainland Europe. T1 is usually used in the US and Canada. T1 (Japan) is usually used in Japan. Refer to your ISDN network provider if you are unsure of which interface type to select. The ISDN gateway may have to be restarted for changes of this setting to take effect (see Shutting Down the ISDN gateway).
E1 CRC-4 enabled	With an ISDN interface type of *E1* selected, this option selects whether ISDN signalling should make use of the CRC-4 mechanism.	Most E1 ISDN networks require CRC-4 to be enabled, although some (in particular, some French networks) require it to be disabled. Refer to your ISDN network provider if you are unsure whether to enable or disable CRC-4. The ISDN gateway may have to be restarted for changes of this setting to take effect (see Shutting Down the ISDN gateway).
Send "sending complete"	An ISDN signalling protocol option.	If you are unsure whether you need to enable this option, refer to your ISDN network provider.
Max incoming ISDN call rate	Selects the maximum bandwidth at which the ISDN side of ISDN to IP calls can be established. The options offered show the bandwidth in terms of Kbps, and the corresponding number of ISDN B-channels required. This setting also enables you to use the ISDN gateway as a PSTN to voice-over-IP gateway (that is, as a voice-only gateway, rather than a video-conferencing gateway); in this case, set the call rate to *Telephone*. Voice calls from the PSTN can then be placed to IP telephones.	The value you enter here is the maximum bandwidth for an incoming ISDN call. The dial plan cannot override this value with a higher maximum bandwidth. However, by using the dial plan you can impose a lower bandwidth for particular calls. Also, note that the calling ISDN endpoint may elect to establish a call at a lower bandwidth. If you have selected *Telephone*, then the ISDN gateway will forward ISDN calls as audio-only IP calls (see Using the ISDN gateway for Voice-Only Calls).
Max outgoing ISDN call rate	Selects the maximum bandwidth at which the ISDN side of IP to ISDN calls can be established. The options offered show the bandwidth in terms of Kbps, and the corresponding number of ISDN B-channels required. This setting also enables you to use the ISDN gateway as a voice-over-IP to PSTN gateway (that is, as a voice-only gateway, rather than a video-conferencing gateway); in this case, set the call rate to *Telephone*. Voice calls from IP telephones can then be placed to regular PSTN telephones.	The value you enter here is the maximum bandwidth for an outgoing ISDN call. The dial plan cannot override this value with a higher maximum bandwidth. However, by using the dial plan you can impose a lower bandwidth for particular calls. Also, note that the calling ISDN endpoint may elect to establish a call at a lower bandwidth. If you have selected *Telephone*, then the ISDN gateway will forward IP calls as audio-only ISDN calls (see Using the ISDN gateway for Voice-Only Calls).
Maximum call duration	Allows the length of all calls to be limited. It is possible to select *no limit*.	You may wish to impose a maximum call duration to limit ISDN calling costs.

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Forbid outgoing ISDN calls	When enabled, this option allows only ISDN to IP calls to be made through the ISDN gateway.	Use this feature if you wish to prevent potentially costly outgoing ISDN calls being placed.

Advanced settings

Field	Field Description	Usage Tips
Audio codecs allowed	Restricts the choice of audio codecs that endpoints calling through the ISDN gateway may select.	IP and ISDN endpoints between themselves negotiate which audio codecs to use during a call. Use these options if you wish to restrict the choices available. Prohibiting audio codecs may prevent endpoints negotiating a compatible codec; use these options only if you experience a particular problem when using a certain codec with the ISDN gateway. If the IP endpoint is in fact a Codian MCU or IP VCR, consider disabling the codec on that device instead.
Video codecs allowed	Restricts the choice of video codecs that endpoints calling through the ISDN gateway may select.	IP and ISDN endpoints between themselves negotiate which video codecs to use during a call. Use these options if you wish to restrict the choices available. Prohibiting video codecs may prevent endpoints negotiating a compatible codec; use these options only if you experience a particular problem when using a certain codec with the ISDN gateway. If the IP endpoint is in fact a Codian MCU or IP VCR, consider disabling the codec on that device instead. Note that *H.263* also encompasses *H.263+*.
H.239 video codecs allowed	Restricts the choice of H.239 codecs that endpoints calling through the ISDN gateway may select. H.239 allows a separate presentation stream alongside the video stream.	IP and ISDN endpoints between themselves negotiate which H.239 codecs to use during a call. Use these options if you wish to restrict the choices available. Prohibiting H.239 codecs may prevent endpoints negotiating a compatible codec; use these options only if you experience a particular problem when using a certain codec with the ISDN gateway. If the IP endpoint is in fact a Codian MCU or IP VCR, consider disabling the codec on that device instead.

Related Topics

- Configuring ISDN Ports Settings
- Shutting Down the ISDN gateway

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Configuring ISDN Ports Settings

These settings affect the per-port ISDN configuration of the ISDN gateway. Use these settings to configure ISDN ports to the requirements of your ISDN network. To access these settings, choose **Home > Settings > ISDN ports**, then select the port of interest using the numbered links displayed.

Note that some ISDN configuration must be done on a unit-wide basis; see Configuring General ISDN Settings.

Refer to the sections below for assistance configuring the ISDN ports settings. After making changes to any port, click **Apply changes**. If you select a different port before clicking **Apply changes**, then any changes will be lost.

Port N settings

Field	Field Description	Usage Tips
Enabled	Selects whether this port may be used to make and receive ISDN calls.	
Directory Number (DN)	Specifies the directory number of this ISDN port.	This field is currently for information only and is not used by the ISDN gateway when making outgoing or receiving incoming calls.
Low channel	Specifies the lowest numbered B-channel available.	An ISDN PRI comprises a number of B-channels. A complete PRI has 30 available B-channels when using E1, and 23 when using T1 or J1. Your ISDN network provider may offer a complete or *fractional* PRI (where a reduced number of B-channels are available). In either case, the low channel number is generally 1. Refer to your ISDN network provider if you are unsure of which value to use here.
High channel	Specifies the highest numbered B-channel available.	An ISDN PRI comprises a number of B-channels. A complete PRI has 30 available B-channels when using E1, and 23 when using T1 or J1. Your ISDN network provider may offer a complete or *fractional* PRI (where a reduced number of B-channels are available). Refer to your ISDN network provider if you are unsure of which value to use here.
Channel search order	Select whether free B-channels should be selected starting with the low-numbered channel and working towards the high-numbered channel, or the other way around.	When making outgoing ISDN calls, the ISDN gateway requests that the ISDN network makes the call using a particular set of B-channels; when receiving incoming ISDN calls, the ISDN network informs the ISDN gateway which B-channels are in use. To minimize the risk of a new incoming call using the same B-channels as a new outgoing call starting at the same time, you should generally set the ISDN gateway to search free channels in the reverse order to the ISDN network. Refer to your ISDN network provider if you are unsure of which value to use here.

Related Topics

- Configuring General ISDN Settings

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Configuring Gatekeeper Settings

You can configure the ISDN gateway to use a gatekeeper, which can make it easier for end-users to join conferences using directory numbers rather than requiring them to know the IP address or host name of the ISDN gateway.

To configure gatekeeper settings, go to **Home > Settings > Gatekeeper**.

- Gatekeeper Settings
- Gatekeeper Status

Gatekeeper Settings

Refer to this table for assistance configuring the gatekeeper settings. After making any configuration changes, click **Apply Changes**.

Field	Field Description	Usage Tips
H.323 gatekeeper usage	Enables the ISDN gateway to use an H.323 gatekeeper for registration of numeric identifiers for its conferences.	Choose from: • **Disabled**: the gatekeeper is not consulted when determining where to direct a call. No gatekeeper registrations will be attempted (and existing registrations will be torn down), regardless of other gatekeeper or per-conference settings. • **Enabled**: the gatekeeper is consulted to see if it knows where to direct a call. The ISDN gateway will attempt to make registrations with the gatekeeper, and the gatekeeper will be contacted for incoming and outgoing calls. If the gatekeeper does not respond, calls are still connected if possible. • **Required**: the gatekeeper is consulted to determine where to direct a call. If that fails, the call will not be allowed.
H.323 gatekeeper address	Identifies the network address of the gatekeeper to which ISDN gateway registrations should be made.	This can be specified either as a host name or as an IP address. This field will have no effect if *H.323 Gatekeeper usage* (see above) is set to *Disabled*.
Ethernet port association	Whether a call involves consultation with the configured gatekeeper also depends on the *Port A* and *Port B* settings. If you intend for the gatekeeper to be used, the port over which that connection will be made, must be selected here. For all incoming calls, and outgoing calls dialed by address rather than by E.164 phone number, the gatekeeper will only be used to validate the connection if the network port over which the connection is made is selected here.	**NOTE: Port B cannot be enabled on the Codian ISDN gateway**
H.323 ID	Specify an identifier that the ISDN gateway uses to register itself with the gatekeeper. You can specify a name or number.	If you are using a gatekeeper, you must enter a registration ID. Before the ISDN gateway can register any conferences with the H.323 gatekeeper, it must make a unit-wide registration.

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Dial plan prefix	Specify a group of digits which the H.323 gatekeeper may use to identify calls to be routed to the ISDN gateway.	This field is optional. If set, users dialing any number beginning with this prefix will have their call directed to the ISDN gateway. This might be useful if you wish to create conferences in response to unknown E.164 numbers. This field will have no effect if *H.323 gatekeeper usage* is disabled.

Gatekeeper Status

The ISDN gateway also displays brief status information about any registered gatekeepers.

Field	Field Description	Usage Tips
Gatekeeper status	Displays the status of the gatekeeper currently being used by the ISDN gateway.	This will be one of: • **name resolved to <IP address>**: the ISDN gateway has successfully validated the IP address of the gatekeeper. • **not in use**: there is no gatekeeper in use • **name resolution in progress**: the ISDN gateway is trying to validate an IP address or find the IP address that corresponds to the specified host name for the gatekeeper. • **retrying name resolution**: the ISDN gateway is again trying to validate an IP address or find the IP address that corresponds to the specified host name for the gatekeeper. • **failed to resolve gatekeeper name**: the ISDN gateway could not find the IP address of the gatekeeper.
Number of active registrations	This number refers to the H.323 ID and the Dial plan prefix. It also shows whether these registrations are pending (in progress, but not fully registered) or active (fully registered).	The number of registrations can therefore be: 0,1, or 2.

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Upgrading the ISDN gateway

If you need to upgrade the firmware or activate features on the ISDN gateway, refer to these topics:

- Upgrading the Main ISDN gateway Software Image
- Upgrading the Loader Software Image
- Enabling ISDN gateway features

Upgrading the Main ISDN gateway Software Image

The main ISDN gateway software image is typically the only firmware component that you will need to upgrade.

Follow these steps to upgrade this image:

1. Check the **Current version** field to verify the currently installed version.
2. Log onto the Codian support pages to identify if a more recent image is available.
3. Download the latest available image and save it to a local hard drive.
4. Unzip the image file.
5. Log on to the ISDN gateway web browser interface.
6. Go to **Home > Settings > Upgrade**.
7. Click on the **Browse** button to locate the unzipped file on your hard drive.
8. Click the **Upload software image** button. The browser begins uploading the file to the ISDN gateway, and a new browser window opens to indicate the progress of the upload. When finished, the browser window refreshes and indicates that the "Main imagine upgrade completed."
9. Shutdown and restart the ISDN gateway (see Shutting Down the ISDN gateway).

Upgrading the Loader Software Image

Upgrades for the Loader software image are as frequently available as upgrades to the main software image.

Follow these steps to upgrade this image:

1. Check the **Current version** field to verify the currently installed version.
2. Log onto the Codian support pages to identify if a more recent image is available.
3. Download the latest available image and save it to a local hard drive.
4. Unzip the image file.
5. Click on the **Browse** button to locate the unzipped file on your hard drive.
6. Click the **Upload loader software** button. The browser begins uploading the file to the ISDN gateway, and a new browser window opens to indicate the progress of the upload. When finished, the browser window refreshes and indicates that the "Loader upgrade completed."
7. Shutdown and restart the ISDN gateway (see Shutting Down the ISDN gateway).

Enabling ISDN gateway features

The ISDN gateway requires activation before calls can be placed through it. If the ISDN gateway had not yet been activated, the banner at the top of the web interface will show a prominent warning; in every other respect the web interface will look and behave normally.

If this is a new ISDN gateway you should receive the unit already activated; if it is not, you have upgraded to a newer firmware version, or you are enabling a new feature, you may need to contact Codian or your supplier to obtain an appropriate activation code. Activation codes are unique to a particular ISDN gateway so ensure you know the unit's serial number such that you may receive a code appropriate to your ISDN gateway.

Regardless of whether you are activating the ISDN gateway or enabling an advanced feature, the process is the same:

1. Check the **Activated features** (ISDN gateway activation is shown in this same list) to confirm that the feature you require is not already activated.
2. Enter the new feature code into the **Activation code** field exactly as you received it, including any dashes.
3. Click the **Update features** button. The browser window should refresh and list the newly activated feature,

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showing the activation code beside it. Activation codes may be time-limited. If this is the case, an expiry date will be displayed, or a warning that the feature has already expired. Expired activation codes remain listed, but the corresponding feature will not be activated.
If the activation code is not valid, you will be prompted to re-enter it.

4. It is recommended that you record the activation code in case you need to re-enter it in the future.
5. Successful ISDN gateway or feature activation has immediate effect and will persist even if the unit is restarted

Related Topics

- Shutting Down the ISDN gateway

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Shutting Down the ISDN gateway

It is sometimes necessary to shut down the ISDN gateway, generally to restart as part of an upgrade (see Upgrading the Firmware). You should also shut down the ISDN gateway before intentionally removing power from the ISDN gateway.

Shutting down the ISDN gateway will disconnect all active calls.

To shut down the ISDN gateway, follow these steps:

1. Go to **Home > Settings > Shutdown**.
2. Click the **Shutdown ISDN gateway** button.
3. Confirmation of shutdown is required; the button changes to **Confirm ISDN gateway shutdown**.
4. Click again to confirm.
5. The ISDN gateway will begin to shut down. The banner at the top of the page will change to indicate this.
6. When the shutdown is complete, the button will change to **Restart ISDN gateway**.
7. Click this button a final time to restart the ISDN gateway

Related Topics

- Upgrading the Firmware

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Displaying General Status

The General Status displays an overview of the ISDN gateway status. To access this information, go to **Home > Status > General.**

Refer to the sections below for assistance in interpreting the information displayed.

System status

Refer to the table below for details of the information displayed

Field	Field Description
Model	Indicates specific Codian ISDN gateway model
Serial number	Shows the unique serial number of the ISDN gateway
Software version	Displays installed firmware version
Build	Displays build version of installed firmware
Up time	Displays time since the last restart of the ISDN gateway
Current time	Displays current time.
Host name	Displays the host name assigned to the ISDN gateway
IP address	Displays the IP address assigned to the ISDN gateway
CPU load	Displays an overview of the current processing load on the ISDN gateway.

System time

The current time and date is displayed for reference. To modify the time or date, enter the required values into the appropriate fields, and click **Change system time** to make the changes take effect.

System log

The ISDN gateway records the most recent shutdown events for reference. The time and date of such events is shown, along with the reason for the shutdown. Normally the reason will indicate that the shutdown was user requested (see Shutting Down the ISDN gateway).

Related Topics

- Displaying ISDN Status
- Displaying Hardware Health Status
- Shutting Down the ISDN gateway

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Displaying ISDN Status

The ISDN status page displays an overview of the current state and configuration of the ISDN ports.

To display ISDN status, go to **Home > Status > ISDN**.

Information is shown in a table, with one row per physical port of the ISDN gateway. This means that one-, two- and four-port units will show four rows and eight-port units will show eight rows. Refer to the table below for details of the information displayed in each row.

Field	Field Description	Usage Tips
Port	Shows the number of the port to which this information relates.	
Link	Shows *up* when this port is connected to and has established communication with the ISDN network, and *down* otherwise.	
Type	Shows the interface type configured for this port.	To change the interface type, see Configuring General ISDN Settings.
Enabled	Shows whether or not this port is enabled.	A port may be disabled because it is not supported by the particular model of ISDN gateway or because it has been explicitly disabled by the user (see Configuring ISDN Ports Settings).

Related Topics

- Displaying General Status
- Displaying Hardware Health Status
- Configuring General ISDN Settings
- Configuring ISDN Ports Settings

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Displaying Hardware Health Status

The Health Status displays information about the hardware components of the ISDN gateway. To access this information, go to **Home > Status > Health.**

To reset these values, click **Clear**. Refer to the table below for assistance in interpreting the information displayed.

Field	Field Description	Usage Tips
Fans **Voltages** **RTC battery**	Displays three possible states: • OK • Out of spec • Critical States indicate both **Current Status** and **Worst Seen** conditions.	• **OK**: component is functioning properly • **Out of spec**: check with your support provider; component might require service. If the **Worst Seen** column displays "Out or spec", but **Current Status** is "OK", monitor the status regularly to verify that it was only a temporary condition.
Temperature	Displays three possible states: • OK • Out of spec • Critical States indicate both **Current Status** and **Worst Seen** conditions.	• **OK**: temperature of the ISDN gateway is within the appropriate range • **Out of spec**:Check the ambient temperature (should be less than 34 degrees celsius) and verify that the air vents are not blocked • **Critical**: temperature of ISDN gateway is too high. An error also appears in the event log indicating that the system will shutdown in 60 seconds if the condition persists. If the **Worst Seen** column displays "Out or spec", but **Current Status** is "OK", monitor the status regularly to verify that it was only a temporary condition.

Related Topics

- Displaying General Status

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Working with the Event Logs

If you are experiencing complex issues that require advanced troubleshooting, you may be need to collect information from the ISDN gateway event logs. Typically, you will be working with a Codian support representative who can provide you with assistance in obtaining these logs.

Event log

The event log contains the last 2000 status messages generated by the ISDN gateway. In general these messages are provided for informational purposes, and the presence or absence of particular messages should not present cause for concern. Occasionally *Warnings* or *Errors* may be shown in the event log. Again the presence of such messages need not necessarily present cause for concern; if you are experiencing a specific problem with the operation or performance of the ISDN gateway, a Codian support representative will be able to interpret logged messages and their significance for you.

Note: You can download the event log as a text file: go to **Home > Events** and click **Download as text**.

Capture filter

The capture filter allows you to change the level of detail to collected in the event log traces.

You should not modify these settings unless instructed to do so by a Codian support representative.

Normally, the capture filter should be set to the default of *Errors, Warnings and Information* for all logging sources. There is no advantage to changing the setting of any source without advice from a Codian support representative. The diagnostic information generated by the ISDN gateway can be very verbose and enabling excessive debugging without advice can cause the event log to become full very quickly and is not advised.

Display filter

The display filter allows you to view or highlight stored event log entries. You should not normally need to view or modify any of the settings on this page

Syslog

You can configure the ISDN gateway to send event messages to up to four syslog servers.

To add or remove a syslog server, go to **Home > Events > Syslog** and make the changes you require.

H.323 log

The H.323 log allows you to record and view H.323 (call control) events. As with the event log, you should not need to view or modify any of the settings on this page unless instructed to do so by a Codian support representative.

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Backing Up and Restoring the Configuration

You can back up the configuration of the ISDN gateway to a file that you can store away from the unit. If necessary this file can be used to restore the configuration of the unit.

To back up the configuration:

1. Ensure that the FTP service is enabled on the **Home > Settings > Services** page.
2. Connect to the ISDN gateway using an FTP client. When asked for a username and password, use the same ones that use to log in to the unit's web interface as an administrator. You will see a file called configuration.xml. This contains the complete configuration of your unit.
3. Copy this file and store it somewhere safe.

The backup process is now complete.

To restore the configuration:

1. Locate the copy of the configuration.xml file that you want to restore.
2. Ensure that the FTP service is enabled on the **Home > Settings > Services** page.
3. Connect to the ISDN gateway using an FTP client. When asked for a username and password, use the same ones that use to log in to the unit's web interface as an administrator.
4. Upload your configuration.xml file to the unit, overwriting the existing file on the unit.

The restore process is now complete.

Note that you must reboot the unit if the restored configuration file contains changes to the ISDN port settings.

The same process can be used to transfer a configuration from one unit to another. However, before doing this, be sure to keep a copy of the original feature keys from the unit whose configuration is being replaced.

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Contact Details and License Information

Please refer to the following sections for details of where to get further help and for additional ISDN gateway software license information:

- Codian
- Software licenses

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